Organisms and Their Environment

4-2 Students will demonstrate an understanding of the characteristics and patterns of behavior that allow organisms to survive in their own distinct environments. (Life Science)

4-2.3 Explain how humans and other animals use their senses and sensory organs to detect signals from the environment and how their behaviors are influenced by these signals.

Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: In kindergarten (K-3.2), students identified the functions of the sensory organs (including eyes, nose, ears, tongue, and skin). In 6th grade (6-3), students will further develop the concept of animal behaviors responding to their environments. In 7th grade (7-3), students will study the human body systems.

It is essential for students to know that animals, including humans, have sensory organs that allow them to detect changes in their environments. After these changes are detected, the organism responds with certain behaviors. A *behavior* is a response to a change in the environment.

Senses tell animals what they need to know about their environment.

- *Sensory organs* are any part of the body that receives signals from the environment.
- They help to keep them out of danger and enable them to find food and shelter.

Many animals have the same type of sense organs as humans. In some cases, animals do not have all the sense organs that humans have.

Sensory Organs and Related Behaviors			
Senses	**Signals Detected**	**Examples of Sensory Organs in Humans and Other Animals**	**Examples of Behaviors of Humans and Other Animals**
Sight	Detects colors, shapes, sizes, space/distance, light, movement	Humans have eyes; Other animals' eyes may differ in type, number, and in location on the body	Locate food or shelter; recognize objects or other organisms
Hearing	Receives vibrations, detects sound	Humans have ears; Other animals' hearing organs differ in type and in location on the body	Locate food; sense danger to escape enemies; communication
Taste	Detect flavors; humans detect salty, sweet, bitter, and/or sour tastes	Humans have taste buds on tongues; Other animals' taste organs differ in type and in location on the body	Judge which foods are okay to eat
Smell	Detects odors	Humans have a nose; Other animals' smelling organs differ in type and in location on the body	Avoid danger; find food; recognize other organisms

Touch	Detects shapes, size, temperature, texture, pain, vibrations, pressure	Humans have a skin; Other animals' touching organs differ in type and in location on the body	Identify food; react to dangerous situations; care for each other

In general, every animal has the senses it needs for its own environment and way of life. However, some animals need different information about the world to survive. They have senses that are very different from humans. For example:

- echolocation in bats,
- night vision of some snakes,
- electric senses of rays and sharks,
- magnetic senses of migratory birds, butterflies, and some whales.

It is not essential for students to know the anatomy of the structures of the five sensory organs in humans or the functioning of the central nervous system.

Assessment Guidelines:
The objective of this indicator is to *explain* the effects sensory organs play in influencing an animal's behavior; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the various ways that sensory organs detect signals in the environment resulting in behavioral responses. However, appropriate assessments should also require students to *recall* types and functions of sensory organs of humans and other animals; or *exemplify* the ways that an animal's senses affects the animal's behavior.